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Managing Soil by the Inches

Mahdi Al-Kaisi

Iowa State University, malkaisi@iastate.edu

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Integrated Crop Management NEWS

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Managing Soil by the Inches

By Mahdi Al-Kaisi, Department of Agronomy

It is eye opening when you work with the best soil formation in the world and see soil with only a few inches of depth, and scratching through it with your hand you find bedrock!

Recently, I was in Guam attending a soil carbon conference organized by the University of Guam. Scientists from the U.S. mainland, China and other Pacific Rim islands attended and presented at the conference. We had a chance to visit several research farms and farmers' fields on the island. The island is equivalent in size to a small Iowa county: approximately 32 miles long and 17 miles wide. The temperature was a constant 90 F day and night, and humidity was over 50 percent at all times. The conditions reminded me of Iowa weather during the month of July.

However, a significant difference from Iowa is the absence of well-developed soil. Their soils are only a few inches deep, and sit on volcanic bedrock. They are characterized by a lack of nutrients, high aluminum content and extremely low pH. It reminded me of not only how fortunate we are to have, arguably, the best soil formation in the world, but also how we take our soils here for granted in the way we often manage it.

The chemical and physical conditions of soil in Guam present significant production and health challenges. Yes, human health challenges for the island's native inhabitants. The majority of agriculture production is tropical fruits, with a few acres in vegetable production. The side effects of the soil chemical makeup are not only on poor crop yields, but also negative human health effects.

Studies suggested trace metal toxicity, and exposure to these metals from food and water derived from the soil are believed to be the cause of Amyotrophic Lateral Sclerosis-Parkinson Dementia Complex disease in the early 1950s. This neurological disorder was linked to high concentrations of aluminum and manganese in the southern part of the island soil, where certain trees grow, and are utilized by people in that region. The tree is called Cycad, where people used its fruit seeds as part of their diet. The discovery of this disease has lead researchers to link it to high concentration of aluminum in spinal cords of patients who used Cycad seeds as part of their diets.

The people of Guam developed soil management skills over generations and kept the few inches they have despite the harsh chemical and physical soil conditions that have both negative health and environmental effects. The magnitude of challenges Guam's people face are huge in managing their soils. In particular, the soil conditions dramatically affect human survival. The few inches of soil are not suitable to support crop production systems. In some cases you can scratch the soil surface by hand and hit the bedrock!

Our soil is not only a source of survival for the people in our state, but globally. Iowa's agriculture, completely dependent on our soil, is feeding people across the Pacific and around the world either directly or indirectly.

Despite all the weather challenges we face here in Iowa, such as the recent floods and drought in different parts of the state, it is imperative that we double our efforts in promoting soil conservation practices to protect our precious soils and sustain their quality.

We have great soil resources in Iowa and must manage our soil and keep it in its unique and productive condition. We, too, need to manage it by the inch in order to have healthy, productive people and a safe environment.

Mahdi Al-Kaisi is an associate professor in agronomy with research and extension responsibilities in soil management and environmental soil science. He can be reached at malkaisi@iastate.edu or (515) 294-8304.

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